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## SEQUENCE LISTING

<110> David B.  
Yang, Joo-Sung

<120> Compositions and Methods of Using Capsid Protein From Flaviviruses and Pestiviruses

<130> Upn-4105

<140> 09/971,980

<141> 2001-10-04

<150> 60/237,885

<151> 2000-10-04

<160> 73

<170> PatentIn version 3.1

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Thr Val Gln Gln Leu Thr Arg Phe Ser Leu Gly Met Leu Gln Lys Gly  
20 25 30

Arg Gly Pro Leu Lys Leu Phe Met Ala Leu Val Ala Phe Leu Arg Phe  
35 40 45

Leu Thr Ile Pro Pro Thr Ala Gly Ile Leu Lys Arg Trp Gly Thr Ile  
50 55 60

Lys Lys Ser Lys Ala Ile Asn Val Leu Arg Gly Phe Arg Lys Glu Ile  
65 70 75 80

Gly Arg Met Leu Asn Ile Leu Asn Arg Arg  
85 90

<210> 13  
<211> 89  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 13

Lys Ser Arg Ala Val Asn Met Leu Lys Arg Gly Met Pro Arg Val Leu  
1 5 10 15

Ser Leu Ile Gly Leu Lys Arg Ala Met Leu Ser Leu Ile Asp Gly Lys  
20 25 30

Gly Pro Ile Arg Phe Val Leu Ala Leu Leu Ala Phe Phe Arg Phe Thr  
35 40 45

Ala Ile Ala Pro Thr Arg Ala Val Leu Asp Arg Trp Arg Gly Val Asn  
50 55 60

Lys Gln Thr Ala Met Lys His Leu Leu Ser Phe Lys Lys Glu Leu Gly  
65 70 75 80

Thr Leu Thr Ser Ala Ile Asn Arg Arg  
85

<210> 14  
<211> 90  
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<220>  
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<400> 14  
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aaaccaggag gccccggcaa gagccgccc 90

<210> 15  
<211> 90  
<212> DNA  
<213> Artificial Sequence

<220>  
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<400> 15  
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aaaccaggtg gccccggcaa gagccgcgcc	90
<210> 16	
<211> 88	
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<400> 16	
ggctcagcat ggccgcgttc aggccaatca ggctcagcac gcggggcatg ccgcgcgttca	60
gcatgttcac ggccgcggctc ttgccggg	88
<210> 17	
<211> 90	
<212> DNA	
<213> Artificial Sequence	
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<400> 17	
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gccctgctgg ccttcttccg cttcaccgccc	90
<210> 18	
<211> 89	
<212> DNA	
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<400> 18	
ggtgcttcat ggccgtctgc ttgttcacgc cgccgcagcg gtccagcacg ggcgggtgg	60
gggcaatggc ggtgaagcgg aagaaggcc	89
<210> 19	
<211> 89	
<212> DNA	
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<400> 19	
ccgccatgaa gcacctgctg agcttcaaga aggagctggg caccctgacc agcgcattca	60
accgcgcag cagcaagcag aagaagcgc	89
<210> 20	
<211> 81	
<212> DNA	
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<400> 20	
cgcgcacg ctggcgatca ggccaatcat cacggcaatg ccggcttgc cgccgcgtt	60
cttctgcttg ctgctgcggc g	81

<210> 21  
<211> 39  
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<220>  
<223> Novel Sequence

<400> 21  
cccaagcttg cccgcaccat ggactggacc tggatcctg

39

<210> 22  
<211> 33  
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<220>  
<223> Novel Sequence

<400> 22  
cccaagcttg cccgcaccat ggattggact tgg

33

<210> 23  
<211> 37  
<212> DNA  
<213> Artificial Sequence

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<400> 23  
atagtttagc ggccgcgccc acgctggcga tcaggcc

37

<210> 24  
<211> 8  
<212> PRT  
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<220>  
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<400> 24

Lys Gly Pro Ile Arg Phe Val Leu  
1 5

<210> 25  
<211> 8  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 25

Gly Gly Pro Gly Lys Ser Arg Ala  
1 5

<210> 26  
<211> 8  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 26

Ile Ala Pro Thr Arg Ala Val Leu  
1 5

<210> 27  
<211> 40  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 27

Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu  
1 5 10 15

Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg Ile Gly Ile Ile  
20 25 30

Gln Gln Arg Arg Thr Arg Asn Gly  
35 40

<210> 28  
<211> 43  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 28

Arg Trp Arg Gly Val Asn Lys Gln Thr Ala Met Lys His Leu Leu Ser  
1 5 10 15

Phe Lys Lys Glu Leu Gly Thr Leu Thr Ser Ala Ile Asn Arg Arg Ser  
20 25 30

Ser Lys Gln Lys Lys Arg Gly Gly Lys Thr Gly  
35 40

<210> 29  
<211> 106  
<212> PRT  
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<220>  
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<400> 29

Ala Val Lys Thr Val Ala Ser Ala Leu Gln Phe Gly Val Asp Ala Leu  
1 5 10 15

Glu Arg Gly Leu Ile Asn Thr Val Leu Ser Val Lys Leu Arg His Ala  
20 25 30

Pro Pro Met Phe Ile Leu Gln Thr Leu Ala Asp Pro Thr Phe Thr Glu  
35 40 45

Arg Gly Phe Ser Lys Thr Val Lys Ser Asp Leu Ile Ala Met Phe Lys  
50 55 60

Arg His Leu Leu Glu His Ser Phe Phe Leu Asp Arg Ala Glu Asn Met  
65 70 75 80

Gly Ser Gly Phe Ser Gln Tyr Ser Arg Leu Ser Glu Met Val Ala Ala  
85 90 95

Val Ser Gly Glu Ser Val Leu Lys Gly Val  
100 105

<210> 30  
<211> 110  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 30

Pro Gly Lys Ser Arg Ala Val Asn Met Leu Lys Arg Gly Met Pro Arg  
1 5 10 15

Val Leu Ser Leu Ile Gly Leu Lys Arg Ala Met Leu Ser Leu Ile Asp  
20 25 30

Gly Lys Gly Pro Ile Arg Phe Val Leu Ala Leu Leu Ala Phe Phe Arg  
35 40 45

Phe Thr Ala Ile Ala Pro Thr Arg Ala Val Leu Asp Arg Trp Arg Gly  
50 55 60

Val Asn Lys Gln Thr Ala Met Lys His Leu Leu Ser Phe Lys Lys Glu  
65 70 75 80

Leu Gly Thr Leu Thr Ser Ala Ile Asn Arg Arg Ser Ser Lys Gln Lys  
85 90 95

Lys Arg Gly Gly Lys Thr Gly Ile Ala Val Met Ile Gly Leu  
100 105 110

<210> 31  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 31

His Met Met Val Ile Phe Arg Leu Met Arg Thr Asn Phe Leu Ile Lys  
1 5 10 15

Phe Leu Leu Ile His Gln Gly Met His Met Val Ala Gly His Asp Ala  
20 25 30

Asn Asp Ala Val Ile Ser Asn Val Ala Gln Ala Arg Phe Ser Gly Leu  
35 40 45

Leu Ile Val Lys Thr Val Leu Asp His Ile Leu Gln Lys Thr Glu Arg  
50 55 60

Gly Val Arg Leu His Pro Leu Ala Arg Thr Ala Lys Val Lys Asn Glu  
65 70 75 80

Val Asn Ser Phe Lys Ala Ala Leu Ser Ser Leu Ala Lys His Gly Glu  
85 90 95

Tyr Ala Pro Phe Ala Arg Leu Leu Asn Leu  
100 105

<210> 32  
<211> 108  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 32

Lys Ser Arg Ala Val Asn Met Leu Lys Arg Gly Met Pro Arg Val Leu  
1 5 10 15

Ser Leu Ile Gly Leu Lys Arg Ala Met Leu Ser Leu Ile Asp Gly Lys  
20 25 30

Gly Pro Ile Arg Phe Val Leu Ala Leu Ala Phe Phe Arg Phe Thr  
35 40 45

Ala Ile Ala Pro Thr Arg Ala Val Leu Asp Arg Trp Arg Gly Val Asn  
50 55 60

Lys Gln Thr Ala Met Lys His Leu Leu Ser Phe Lys Lys Glu Leu Gly  
65 70 75 80

Thr Leu Thr Ser Ala Ile Asn Arg Arg Ser Ser Lys Gln Lys Lys Arg  
85 90 95

Gly Gly Lys Thr Gly Ile Ala Val Met Ile Gly Leu  
100 105

<210> 33  
<211> 20  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 33

Lys Pro Asp Gly Ser Glu Cys Leu Pro Ala Ala Pro Asp Gly Ile Arg  
1 5 10 15

Gly Phe Pro Arg  
20

<210> 34  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 34

Lys Pro Gly Gly Pro Gly Lys Ser Arg Ala Val Asn Met Leu Lys Arg  
1 5 10 15

Gly Met Pro Arg  
20

<210> 35  
<211> 23  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 35

Leu Gln Leu Phe Leu Arg Ala Thr Thr Glu Leu Arg Thr Phe Ser Ile  
1 5 10 15

Leu Asn Arg Lys Ala Ile Asp  
20

<210> 36  
<211> 24  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 36

Leu Leu Ala Phe Phe Arg Phe Thr Ala Ile Ala Pro Thr Arg Ala Val  
1 5 10 15

Leu Asp Arg Trp Arg Gly Val Asn  
20

<210> 37  
<211> 47  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 37

Arg Ser Ala Arg His Pro Trp Arg Ile Arg Phe Gly Ala Pro Gln Ala  
1 5 10 15

Phe Leu Ala Gly Leu Leu Ala Thr Val Ala Val Gly Thr Ala Arg  
20 25 30

Ala Gly Leu Gln Pro Arg Ala Asp Met Ala Ala Pro Pro Thr Leu

35

40

45

<210> 38  
<211> 52  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 38

Arg Ala Val Leu Asp Arg Trp Arg Gly Val Asn Lys Gln Thr Ala Met  
1 5 10 15

Lys His Leu Leu Ser Phe Lys Lys Glu Leu Gly Thr Leu Thr Ser Ala  
20 25 30

Ile Asn Arg Arg Ser Ser Lys Gln Lys Lys Arg Gly Gly Lys Thr Gly  
35 40 45

Ile Ala Val Met  
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<210> 39  
<211> 45  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 39

Leu His His Cys Ile Ala Arg Trp Ile Ala Gln Arg Gly Gly Trp Val  
1 5 10 15

Ala Ala Leu Asn Leu Gly Asn Gly Pro Ile Leu Asn Val Leu Val Val  
20 25 30

Leu Gly Val Val Leu Leu Gly Gln Phe Val Val Arg Arg  
35 40 45

<210> 40  
<211> 47  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 40

Leu Lys Arg Gly Met Pro Arg Val Leu Ser Leu Ile Gly Leu Lys Arg  
1 5 10 15

Ala Met Leu Ser Leu Ile Asp Gly Lys Gly Pro Ile Arg Phe Val Leu  
20 25 30

Ala Leu Leu Ala Phe Phe Arg Phe Thr Ala Ile Ala Pro Thr Arg  
35 40 45

<210> 41  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 41

Thr Gly Ala Leu Leu Leu Gln Gly Met Ile Ala Ala Val Asp Thr  
1 5 10 15

<210> 42  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 42

Thr Gly Ile Ala Val Met Ile Gly Leu Ile Ala Ser Val Gly Ala  
1 5 10 15

<210> 43  
<211> 44  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 43

Gln Thr Glu Asp Ile Arg Asp Val Leu Arg Phe Met Asp Gly Phe Thr  
1 5 10 15

Thr Leu Lys Glu Asn Ile Met Arg Phe Trp Arg Ser Pro Asn Pro Gly  
20 25 30

Ser Trp Val Ser Cys Gln Val Leu Leu Ala Leu Leu  
35 40

<210> 44  
<211> 45  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 44

Lys Gln Thr Ala Met Lys His Leu Leu Ser Phe Lys Lys Glu Leu Gly  
1 5 10 15

Thr Leu Thr Ser Ala Ile Asn Arg Arg Ser Ser Lys Gln Lys Lys Arg  
20 25 30

Gly Gly Lys Thr Gly Ile Ala Val Met Ile Gly Leu Ile  
35 40 45

<210> 45

<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Novel Sequence  
  
<400> 45

Phe Arg Arg Glu Leu Asp Ala Leu Gly His Glu Leu  
1 5 10

<210> 46  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Novel Sequence  
  
<400> 46

Phe Lys Lys Glu Leu Gly Thr Leu Thr Ser Ala Ile  
1 5 10

<210> 47  
<211> 9  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Novel Sequence  
  
<400> 47

Asp Ser Phe Lys Lys Gly Leu Pro Arg  
1 5

<210> 48  
<211> 9  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Novel Sequence  
  
<400> 48

Asn Met Leu Lys Arg Gly Met Pro Arg  
1 5

<210> 49  
<211> 34  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Novel Sequence  
  
<400> 49

Phe Arg Gln Leu Asp Asn Ser Arg Thr Arg Gln Phe Thr Pro His His  
1 5 10 15

Leu Asn Cys Val Ile Ser Ser Val Tyr Glu Gly Thr Arg Asp Gly Val  
20 25 30

Gly Ala

<210> 50  
<211> 37  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 50

Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp  
1 5 10 15

Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp  
20 25 30

Thr Gly Val Glu Ala  
35

<210> 51  
<211> 44  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 51

Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu  
1 5 10 15

Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg Ile Gly Ile Ile  
20 25 30

Gln Gln Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser  
35 40

<210> 52  
<211> 13  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 52

Asp Phe His Arg Phe Ser Tyr Ile Arg Asp Arg Arg Ala  
1 5 10

<210> 53  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 53

Arg His Ser Arg Ile Gly Ile Ile Gln Gln Arg Arg Thr

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5

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<210> 54  
<211> 18  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 54

Glu Phe Gly Asn Thr Phe Ser Val Pro Asp Pro Leu Arg Glu Val Gln  
1 5 10 15

Arg Leu

<210> 55  
<211> 19  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 55

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu  
1 5 10 15

Gln Gln Leu

<210> 56  
<211> 12  
<212> PRT  
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<220>  
<223> Novel Sequence

<400> 56

Trp Leu Trp Ser Glu Gly Gln Gly Ala Val Phe Tyr  
1 5 10

<210> 57  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 57

Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr  
1 5 10

<210> 58  
<211> 12  
<212> PRT  
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<220>

<223> Novel Sequence

<400> 58

Leu Ser Lys Tyr Leu Ser Asp Leu Leu Phe Val Phe  
1 5 10

<210> 59

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 59

Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe  
1 5 10

<210> 60

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 60

Ile Gly Ala Val Leu Pro Lys Gly Ser Phe Lys Ser Thr Ile Met Arg  
1 5 10 15

Val Leu Asp Glu Met Glu Val Leu Gly Val Arg Ile Met Pro Arg  
20 25 30

<210> 61

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 61

Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu  
1 5 10 15

Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg  
20 25 30

<210> 62

<211> 64

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 62

Pro Gln Ala Ser Ile Arg Gln Ser Gln Glu Glu Pro Glu Asp Leu Arg  
1 5 10 15

Pro Glu Ile Arg Ile Gln Glu Leu Arg Arg Ile Gly Asp Glu Phe Asn

20

25

30

Glu Thr Tyr Thr Arg Arg Val Phe Ala Asp Tyr Arg Glu Ala Glu Asp  
35 40 45

His Pro Gln Met Val Ile Leu Gln Leu Leu Arg Phe Ile Phe Arg Leu  
50 55 60

<210> 63

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 63

Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu Leu  
1 5 10 15

Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp  
20 25 30

Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp  
35 40 45

Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile  
50 55 60

His Phe Arg Ile  
65

<210> 64

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 64

Leu Arg Pro Glu Ile Arg Ile Gln Glu Leu Arg Arg Ile Gly Asp Glu  
1 5 10 15

Phe Asn Glu Thr Tyr Thr Arg Arg Ala Phe Ala Asp Tyr Arg Glu Ala  
20 25 30

Glu Asp His Pro Gln Met Val Ile Leu Gln Leu Leu Arg Phe Ile Phe  
35 40 45

Arg Leu  
50

<210> 65

<211> 53

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 65

Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile  
1 5 10 15

Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr  
20 25 30

Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe  
35 40 45

Ile His Phe Arg Ile  
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<210> 66

<211> 48

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 66

Arg Asn Val Ala Arg Gln Leu His Ile Pro Leu Gln Ser Glu Pro Val  
1 5 10 15

Val Thr Asp Ala Phe Leu Ala Val Ala Gly His Ile Phe Ser Ala Gly  
20 25 30

Ile Thr Trp Gly Lys Val Val Ser Leu Tyr Ser Val Ala Ala Gly Leu  
35 40 45

<210> 67

<211> 52

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 67

Asn Asp Trp Thr Leu Glu Leu Glu Glu Leu Lys Asn Glu Ala Val  
1 5 10 15

Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr  
20 25 30

Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile  
35 40 45

Leu Gln Gln Leu  
50

<210> 68

<211> 53

<212> PRT

<213> Artificial Sequence

<220>  
<223> Novel Sequence

<400> 68

Trp Thr Leu Asp Phe Leu Arg Glu Arg Leu Leu Gly Trp Ile Gln Asp  
1 5 10 15

Gln Gly Gly Trp Asp Gly Leu Leu Ser Tyr Phe Gly Thr Pro Thr Trp  
20 25 30

Gln Thr Val Thr Ile Phe Val Ala Gly Leu Thr Ala Ser Leu Thr Ile  
35 40 45

Trp Lys Lys Met Gly  
50

<210> 69

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 69

Trp Thr Leu Glu Leu Leu Glu Leu Lys Asn Glu Ala Val Arg His  
1 5 10 15

Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr  
20 25 30

Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln  
35 40 45

Gln Leu Leu Phe Ile His Phe Arg Ile Gly  
50 55

<210> 70

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 70

Trp Thr Leu Asp Phe Leu Arg Glu Arg Leu Leu Gly Trp Ile Gln Asp  
1 5 10 15

Gln Gly Gly Trp Val Arg Leu Leu  
20

<210> 71

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 71

Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His  
1 5 10 15

Phe Pro Arg Ile Trp Leu His Ser Leu  
20 25

<210> 72

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 72

Val Phe Gln Ser Trp Trp Asp Arg Asn Leu Gly Arg  
1 5 10

<210> 73

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Novel Sequence

<400> 73

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln  
1 5 10